

REMARKS

The Applicant would like to thank the Examiner for the analysis contained in the Examination Report dated September 25, 2002.

The Applicant thanks the Examiner for noting the discrepancies in the drawings. A number of drawings amendments have been proposed to address the deficiencies noted by the Examiner.

The Applicant thanks the Examiner for noting the discrepancies in the specification. The Applicant has corrected these and other errors which were noted by way of a substitute specification. The undersigned avers that the enclosed substitute specification does not contain any new matter.

Claims 27, 30 and 45 are rejected, under 35 U.S.C. § 102, as being anticipated in view of Stanley. The Applicant acknowledges and respectfully traverses the raised anticipatory rejection in view of the following remarks.

Claims 27, and 30 have been cancelled from the application. The following argument will, therefore, center upon the remaining claims 25 and 45.

The Examiner's analysis of the Stanley reference hinges upon the "mirror surface being co-extensive with a selectively exposed portion of the crystalline plane". For the purpose of the analysis the Examiner has stated that "the crystalline plane is taken to be one of the vertical planes of reflector 6 in the Figure".

As noted by the Examiner, the Stanley reference indicates in column 2 between lines 25 and 30, that "three V-shaped grooves 2-4 have been etched using an anisotropic masking and etching technique". The Stanley reference also states, in column 2 at line 36 that "a cantilevered, vertically hinged silicon beam 6 is positioned in cavity 5 and is integrally formed with the remainder of substrate 1. The beam 6 acts as an optical reflector.

It is respectfully submitted that reflector 6 is not on a crystalline plane accessible by anisotropic masking and etching techniques. The Applicant has conducted some research and has filed a Supplementary Disclosure Statement providing for the Examiner's information a

section on "Silicon Crystallography" taken from the text "Fundamentals of Microfabrication". The purpose of sending the Examiner an excerpt from the text is to demonstrate conclusively to the Examiner, that reflector 6 of Stanley is not an anisotropically etched crystalline plane. The Examiner will note from reviewing the text excerpt, the angular relationship between two crystalline planes that have been anisotropically etched in silicon is 54.74 degrees. This means that reflector 6 is not anisotropically etched. Such a reflector would have a relatively weak reflective surface, as compared to the reflector of the present invention. In contrast, both claims 25 and 45 are directed at a bulk silicon crystal which has a mirror surface co-extensive with an exposed portion of a selected one of the several crystalline planes.

There is a dramatic difference between the micro mirror obtained through the Stanley reference and a micro mirror fabricated in accordance with the teachings of the present invention. As discussed in the specification on page 2 between lines 18 and 24, crystalline planes have an inherent smoothness which is on an atomic level. In contrast, the entire industry has over the last number of years been focused upon micromachining silicon wafers to produce a highly reflective surface as evidenced by the Habuka et al reference discussed in the Background of the specification on page 2 between lines 20 and 30.

Claim 41 presently stands rejected as being anticipated by Petersen. Claim 41 has been cancelled from the application.

In view of the foregoing, it is respectfully submitted that this application is now placed in a condition for allowance. Action to that end, in the form of an early Notice of Allowance, is courteously solicited by the Applicant at this time.

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Respectfully submitted,


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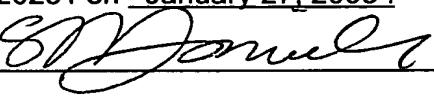
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VERSION OF CLAIMS WITH MARKINGS SHOWING CHANGES

25. (Amended) A high reflectivity micro mirror, comprising:

 a monolithic bulk crystal silicon having an anisotropic body with a crystalline place; and

 a mirror surface co-extensive with a selectively anistropically etched [exposed] portion of the crystalline plane.

45. (Amended) A high reflectivity micro mirror, comprising:

 a monolithic bulk crystal silicon having an anisotropic body with several crystalline planes;

 a mirror surface co-extensive with an anisotropically etched [exposed] portion of a selected one of the several crystalline planes positioned internally within the body; and

 an inlet passage and an outlet passage which intersect at the selected one of the several crystalline planes.